

REMARKS/ARGUMENTS**I. Introduction**

Claims 42-53 have been canceled in view of the fact that they were previously withdrawn from consideration as the result of a restriction requirement. New claims 54-68 have been added. Accordingly, claims 1-41 and 54-68 are now pending.

Applicants thank the Examiner for the opportunity to discuss this application during the February 24, 2005 interview summarized below. **In the event that, after consideration of this amendment, there are any issues remaining which need to be addressed to place the application in condition for allowance the Examiner is invited to contact Applicants undersigned representative by telephone (732) 542-9070 so that said issues can hopefully resolved.**

In the Office Action the Examiner allowed claims 25-28. **Applicants thank the Examiner for this indication of allowable subject matter.**

In the Office Action the Examiner rejected claims 12-24 and 29-34 under 35 U.S.C. §112, second paragraph for various minor wording issues relating to claims 12 and 29. In addition, the Examiner rejected claims 1-24 and 21-41 in view of various references for the reasons set forth in the Office Action.

In view of the above amendment and the following remarks, it is respectfully submitted that the outstanding rejections have been overcome.

## **II. Interview Summary**

This interview summary is presented in the format suggested by the Patent Office.

1. **Application Number:** 10/020,703
2. **Name of Applicants:** John G. N. HENDERSON,  
Carl SCARPA
3. **Name of Examiner:** Dao L. Phan
4. **Date of Interview:** Feb. 24, 2004
5. **Type of Interview:** In Person
6. **Name of Participants:**  
Examiner: Dao L. Phan;  
Applicants' Rep: Michael P. Straub  
Inventor: John Henderson
7. **Exhibit(s) Shown:** Proposed Amendment  
Submitted to Examiner for  
Consideration Prior To  
Interview
8. **Claims discussed:** All the claims under  
consideration were discussed
9. **Prior Art Discussed:** The prior art applied in  
the Office Action was  
discussed.
10. **Proposed Amendments discussed:**

Applicants discussed the proposed amendment attached hereto as Appendix A. Applicants also discussed rewriting claim 3 in independent form since the applied references didn't show sending the position

control signal and signals received over the antenna over the same line, e.g., coaxial cable. The Examiner also suggested deleting "and" from claim 21 as done in the present amendment.

**11. Discussion of General Thrust of the Principal Arguments**

Applicants discussed the arguments provided in the proposed amendment which are restated in this amendment.

**12. Other Pertinent Matters Discussed: None**

**13. General Results/Outcome of Interview**

The Examiner indicated she would consider Applicants amendment when it was filed.

**III. The 35 U.S.C. §112, Second Paragraph Rejections Have Been Overcome**

In the Office Action the Examiner rejected claims 12-24 and 29-34 under 35 U.S.C. §112, second paragraph.

**1. Claims 12-24**

With regard to claim 12, the Examiner states:

As to claim 12, line 3, and claim 21, line 3 "a received broadcast signal processing circuit and for generating" is unclear. (Office Action page 2)

Applicants have amended claims 12 and 21 to delete "and" from the quoted claim element so that the claim language now reads "a received broadcast signal processing circuit for generating". It is respectfully

submitted that, as amended, claims 12 and 21, and claims 13-20 and 22-24 which depend there from are now definite.

## 2. Claims 29-34

In the Office Action the Examiner rejected claim 29 stating:

As to claim 29, lines 3-4, "a plurality of signal components ... including antenna polarization information" is indefinite because this is read as a single means claim. (Office Action page 2)

Applicants believe that claim 29 should not have been interpreted as a single means claim but have amended claim 29 to make it clear that the recited signal includes at least a first component and a second component. As amended claim 29 now recites: Given that the claim now clearly

A multi-bit antenna control signal used for controlling characteristics of an antenna, the control signal comprising:

a first signal component including one of: a direction field including antenna pattern direction control information, a gain field including antenna gain information, a channel number field including a channel number, and a polarization field including antenna polarization information; and

a second signal component, said second signal component including a field which is different from the field included in said first signal component, said second signal component including one of: a direction field including antenna pattern direction control information, a gain field including antenna gain information, a channel number field including a channel

number, and a polarization field including antenna polarization information.

In view of the above amendment to claim 29, it is respectfully submitted that the "single means" rejection of claim 29 has been overcome. Accordingly, claim 29 and claims 30-34 which depend there from are definite.

**IV. The Outstanding Anticipation and/Or Obviousness Rejections Have Been Overcome**

In view of the above amendments, Applicant's arguments which follow, it is respectfully submitted that the rejections made in the Office Action should be withdrawn.

Applicants will now address and highlight the reasons each of the various pending claims is patentable over the applied references.

**1. Claim 1-11 Are Patentable**

In the Office Action, the Examiner rejected claims 1-11 as being anticipated by U.S. Patent No. 3,842,417 to Williams, or U.S. Patent No. 4,045,800 to Tang et al. or U.S. Patent No. 5,701,583 to Harbin et al. None of these references anticipate or render obvious amended claim 1 or amended claim 4 which has been rewritten in independent form.

**A. Claims 1-2**

Claim 1 has been amended to recite:

An antenna apparatus for use with a digital communications channel over which a multi-bit digital control signal is communicated, said antenna apparatus supporting a plurality of antenna pattern positions, different ones of said antenna pattern positions being identified by different predetermined position indicator values, the antenna apparatus comprising:

control circuitry, coupled to the digital communications channel, **the control circuitry including a direction control device for receiving said multi-bit digital control signal, said digital control signal including one of said predetermined position indicator values and at least one other control value, and for generating at least one antenna pattern position control signal from said digital control signal and one additional control signal; and**

a controllable antenna element assembly having a steerable antenna pattern including a plurality of regions including at least a first region having a first gain and a second region having a second gain which is lower than said first gain, **the controllable antenna element assembly being responsive to said at least one antenna pattern position control signal.**

**i) Williams et al.**

The Williams et al. patent cited by the Examiner does not anticipate or render obvious claim 1. In rejecting claim 1 based on the Williams et al. patent the Examiner cites element 28, the scan control described at col. 4, lines 8-31 as corresponding to control circuitry recited in claim. The input to the "scan control 28" of Williams et al. are "synchronization or master clock pulses". **These signals in the applied reference are NOT multi-bit digital control signals that include a**

predetermined position indicator value as required by claim 1, and do not render obvious the use of such multi-bit signals or control circuitry of the type recited in claim 1 which processes such a signal. Furthermore, the input to the "scan control 28" does not include "**at least one other control value**" as required by claim 1. Accordingly the Williams et al. patent does not anticipate or render obvious any of claims 1-11.

ii) Tang et al.

In the Office Action, with regard to claims 1-11, the Examiner states:

Tang et al teach an antenna apparatus including a digital communications channel for receiving (fig. 1), control circuitry 44, coupled to the digital communications channel, the control circuitry including a direction control device for generating, a controllable antenna element assembly having a steerable antenna pattern (fig. 2, and 8).

A review of the Tang et al. patent reveals that, in Tang et al., the input to subarray direction control apparatus 44 is a voltage, i.e., an Analog signal, that is generated by beam direction control driver 42 see col., 3, lines 44-51. Accordingly, the Tang et al. patent fails to teach, disclose or suggest a **multi-bit digital control signal including a predetermined position indicator value as required by claim 1**. Furthermore, the input to the "control apparatus 44" does not include "**at least one other control value**" as required by claim 1. Thus, claim 1 is clearly patentable over the Tang et al. patent as are the claims which depend from claim 1.

ii) Harbin et al.

In the Office Action the Examiner states:

Harbin et al teach an antenna apparatus including a digital communications channel for receiving 28, control circuitry 34, coupled to the digital communications channel, the control circuitry including a direction control device for generating, a controllable antenna element assembly having a steerable antenna pattern (65; fig. 6)

The Harbin patent briefly describes a data processing device 32 and a scanning array control 34 but fails to provide any detailed discussion of the control signals use. Accordingly, **the Harbin patent, like the other applied references, fails to describe a multi-bit digital control signal that includes both a predetermined position indicator value and at least one other control value as required by claim 1.**

**Thus, the reference does not render obvious the use of such a multi-bit control signal or control circuitry of the type recited in claim 1.**

**B. Claim 3**

Independent claim 3 has been rewritten in independent form. As discussed during the telephone interview, none of the applied references used to reject claim 3 show an antenna control which is used to control the direction of the antenna being communicated over the same line or channel used to output the signals received by the antenna. Accordingly, claim 3 which is directed



to using a coaxial cable to communicate both a signal received by an antenna assembly and a multi-bit digital control signal used to control the position of the antenna, is patentable over the applied references.

Thus, claim 3 is patentable because it recites:

An antenna apparatus for use with a digital communications channel over which a multi-bit digital control signal is communicated, said antenna apparatus supporting a plurality of antenna pattern positions, different ones of said antenna pattern positions being identified by different position indicator values, the antenna apparatus comprising:

control circuitry, coupled to the digital communications channel, the control circuitry including a direction control device for receiving said multi-bit digital control signal, said digital control signal including one of said predetermined position indicator values and at least one other control value, and for generating at least one antenna pattern position control signal from said digital control signal; and

a controllable antenna element assembly having a steerable antenna pattern including a plurality of regions including at least a first region having a first gain and a second region having a second gain which is lower than said first gain, the controllable antenna element assembly being responsive to said at least one antenna pattern position control signal, said controllable antenna element outputting a received signal onto said communications channel; and

wherein said communications channel is implemented using a coaxial cable over which both the received signal and said multi-bit digital control signal are communicated.

C. Claims 4-11

The Examiner failed to specifically address the various dependent claims in the original rejection. Claims 4 and 5-11 which depend there from are patentable because none of the references applied against claims 1-11 teach, disclose or suggest a digital control signal that includes both "an antenna position portion and a gain control portion".

Accordingly, claims 4-11 are patentable over the applied references.

2. Claims 12-20 Are Patentable

A. The Rejection Based on Henderson or Ma et al.

The Examiner fails to identify precisely which signal in the applied references the Examiner asserts corresponds to "a digital antenna control signal" recited in claim 12. Applicants have been unable to identify any particular signal in the applied references which satisfies the requirements of the recited "digital antenna control signal".

The antenna controller recited in claim 12 is for generating a digital antenna control signal that includes at least two elements: one of A) gain information, B) polarization control information, and C) channel number information AND antenna pattern position control information.

Claims 12-20 are patentable over the applied references because the Henderson patent and Ma et al. patent do not teach, disclose or suggest "an antenna controller for generating a digital antenna control signal including at least one of gain information, polarization control information, and channel number information, in addition to antenna pattern position control information" as recited in independent claim 12. Thus, claim 12 and claims 13-20 which depend there from, either directly or indirectly, are patentable over the applied references.

**B. The Rejection Based on Ikeda et al.**

Claims 12-20 stand rejected as being anticipated by Ikeda et al. (US 2001/0055948).

Claims 12-20 are patentable over the Ikeda et al. application, like the Henderson and Ma et al. patents, does not teach, disclose or suggest "an antenna controller for generating a digital antenna control signal including at least one of gain information, polarization control information, and channel number information, in addition to antenna pattern position control information" as recited in independent claim 12.

The Examiner's rejection merely states:

Ikeda et al teach a receiver apparatus including a tuner 2 for receiving a broadcast signal, a received broadcast signal processing circuit 5 for generating at least one signal measurement value, an antenna controller (fig. 1, Control Portion)

for generating a digital antenna control signal, and a communications channel (fig. 1) for outputting the digital antenna control signal. (Office Action page 4)

The Ikeda et al. application describes a system where the directivity pattern of an antenna array is controlled by an antenna control signal sent to phase shifters (PHS-1 through PHS-4). See page 3, paragraph [0039] and Fig. 1. This antenna control position which is used to control antenna directivity is generated by a control portion shown in Fig. 1. The system described in the Ikeda et al. application includes a demodulator portion, DEM Portion 3, that generates an automatic gain control signal (AGC) which is separate from the antenna control signal generated by the control portion and which is communicated over separate lines from the antenna control signal.

While arguably, the Ikeada et al. application describes an antenna position control signal and another separate signal used for gain control by teaching completely separate signals, the Ikeada et al. patent not only fails to teach, disclose or suggest an antenna controller that **a digital antenna control signal including at least one of gain information ... in addition to antenna pattern position control information** but actually teaches away from such a digital antenna control signal.

In view of the above discussion, claim 12 and claims 13-20 which depend there from, either directly or

indirectly, are patentable over the Ikeda et al. application.

3. Claims 21-24 Are Patentable

In the Office Action the Examiner rejected claims 21-24 as being anticipated by U.S. Patent No. 4,906,506 to Verma et al. stating:

Verma et al teach a receive apparatus including a tuner (col 2, lines 19-24) for receiving a broadcast signal, a received broadcast signal processing circuit (fig 2) for generating at least one signal measurement value, an antenna controller (15, col. 1 lines 41-51; col 2, lines 24-31) coupled to the broadcast signal processing circuit for generating a digital antenna control signals, and a communications channel (fig. 2) for outputting the digital antenna control signal. (Office Action page 4)

A review of the Verma et al. patent reveals nothing that would anticipate or render obvious the subject matter claimed in claims 21-24.

Claim 21 recites:

A receiver apparatus, comprising:  
a tuner for receiving a broadcast signal from an antenna device;  
a received broadcast signal processing circuit and for generating at least one signal measurement value from said received broadcast signal;  
an antenna controller coupled to said broadcast signal processing circuit for generating digital antenna control signals used to automatically adjust the position of an antenna pattern of said antenna device, the antenna pattern including a plurality of lobes and at least one null so that the null

is orientated in the direction of a source of signal interference; and  
a communications channel for outputting the digital antenna control signals to said antenna device.

In the Verma et al. patent, a mechanical switch 15 is operated by a user to mechanically select by **manually** rotating the switch between three different antenna selections for each of UHF and VHF signal reception. (See Fig. 1 showing system with knob for switch 15 and also see Fig. 2 which shows the switch 15 in further detail.)

There is no automatic adjustment of the position of the antenna pattern in the Verma et al. patent (the position is controlled manually by the user). Accordingly, there are **no digital antenna control signals** used to automatically adjust the position of an antenna pattern, and there is no **an antenna controller of the type recited in claim 21 which generates digital antenna control signals** used to automatically adjust the position of an antenna pattern of said antenna device.

In view of the above discussion, and the **manual mechanical** antenna control system described in the Verma et al. patent, it is respectfully submitted that claim 21 and claims 22-24 which depend there from are neither anticipated nor rendered obvious by the Verma et al. patent.

4. **Claims 25-28 Are Patentable**

Claims 25-28 Stand Allowed.

5. Claims 29-41 Are Patentable

Claim 29 as originally written, and as amended in response to the 35 U.S.C. §112, second paragraph rejection, requires a first signal component and a second signal component which is different from the first signal component. Each of the two signal components includes an information field from the various types of information fields recited in the particular claim element. Thus, claim 29 is directed to a multi-bit antenna control signal including at least two different fields where the two different fields are in the set of fields which includes: an a direction field including antenna pattern direction control information, a gain field including antenna gain information, a channel number field including a channel number, and a polarization field including antenna polarization information. Such a control signal is not taught, suggested or disclosed in the applied reference.

Claims 29-41 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,486,832 to Abramov et al. In rejecting claims 29-41, the Examiner states:

Abramov et al teach a multi-bit antenna control signal and a method of controlling an antenna including generating (32; fig 4) at least one digital control signal, and transmitting (col 1; lines 60+) the digital control signal to an antenna. (Office Action page 4)

A review of the Abramov et al. patent reveals a system in which an antenna can be controlled to move to scan both in azimuth and elevation (See, col. 1, lines 60-67 and col. 2, lines 60-65). This control is achieved through the use of motor control signals generated by an antenna control unit 30 that are used to control a stepper motor 14. (See Fig. 3)

The Abramov et al. patent **clearly lacks the second different information field** which must be one of the types recited in claim 29.

Accordingly, claim 29 and claims 30-34 which depend there from are not anticipated or rendered obvious by the Abramov et al. patent. In addition, claims 35-41 are allowable over the Abramov et al. patent for the same general reasons claims 29-34 are patentable over this reference.

**5. New Claims 54-58 Are Patentable**

New claims 54-58 are believed to be allowable for the same general reasons that claims 25-28 were found to be allowable.

**6. New Claims 59-68 Are Patentable**

New claims 59-62 are directed to subject matter which is believed to be patentable since the prior art, alone or in combination, does not teach disclose or suggest the novel combination of claimed elements including the various digital control signals, which in



many cases include multiple portions which provide different types of control information.


**V. Conclusion**

In view of the foregoing amendments and remarks, the applicants respectfully submit that the pending claims are in condition for allowance. Accordingly, the applicants request that the Examiner pass this application to issue.

Applicants request that the Examiner contact Applicants' undersigned representative by phone if any outstanding issues remain to be resolved to place the application in condition for allowance.

Respectfully submitted,

February 28, 2004


  
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I hereby certify that this paper (and any accompanying paper(s)) is being facsimile transmitted to the United States Patents and Trademark Office on the date shown below.

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February 28, 2005  
Date